670 Challenges and new opportunities in the analysis of raffinose oligosaccharides, phytate and glucosinolates. D. Vinjamoori*, P. Das, and T. Hayes, *Monsanto Co., St. Louis, MO/USA*.

Oligosaccharides of the raffinose series are major components in many grain legumes and are implicated in causing flatulence and diarrhea for both humans and livestock, as they are not hydrolyzed in the upper gut due to the absence of alpha-galactosidase enzyme. Phytic acid has been identified, as an antinutritional factor of soybean since it can reduce the bioavailability of some essential metals and phosphorous because of the formation of insoluble chelates that cannot be absorbed by the intestine under normal physiological conditions. Phytic acid has also been shown to inhibit the action of some important proteins such as trypsin, alpha-amylase and pepsin during digestion. Glucosinolates derived from Brassica species have been clearly shown to have deleterious effects such as reduced fertility and induction of goitrogenic effects in live-stock, premature death in rats and damage to vital organs stemming from the interference with the thyroid

In this presentation we will review the current status of the analytical technologies for the assays of raffinose oligosaccahrides, phytic acid and glucosinolates in terms of selectivity, sensitivity and sample throughput. Implementation of innovative sample preparation schemes, use of novel separation approaches and alternate detector technologies will be presented. The challenges and opportunities posed by these assays will be highlighted along with the recommendations for best analytical practices.

Key Words: Raffinose, Phytate, Glucosinolates

671 Challenges in measuring moisture content of feeds. N. Thiex*[1] and C. R. Richardson[2], [1]*South Dakota State University, Brookings, SD,* [2]*Texas Tech University, Lubbock, TX*.

Accurate determination of the moisture (water) content in individual feed ingredients and mixed feeds is important, but often the analytical methods used differ greatly in effectiveness resulting in over or under evaluation. Bias in measuring the water content of feedstuffs directly effects accurate quantification and expression of other nutrient values and ratios. Factors affecting accurate determination include: range in moisture content, sampling of feedstuffs, transport and storage of laboratory samples, loss of volatiles other than water, and choice of analytical method. Several methods in use to determine apparent water content of feedstuffs are empirical, estimating water by loss of weight on drying, while other methods measure water directly. Poor agreement among laboratories and among methods is illustrated in results of moisture determinations reported to the American Association of Feed Control Officials Check Sample program and in the National Forage Testing Association Proficiency Testing program. Oven drying methods and a Karl Fisher method were compared in this study using forage and dried, ground animal feed. Forages tested included hay, haylage, and corn silage while feeds included various sources of mixed feed with and without urea. Oven drying of forages, compared to the Karl Fischer method, yielded recoveries for hay, haylage, and corn silage, respectively, as follows: 135° C for 2 h # 113%, 162%, and 133%; 104° C for 3 h # 96%, 122%, and 113%; 104° C for 6 h # 97%, 129%, and 117%. Mixed feeds yielded recoveries for non-urea and urea containing feed, respectively, as follows: 135° C for 2 h # 116%, and 2746%; 104° C for 3 h # 88%, and 239%; 95° C for 5 h under vacuum 83%, and 727%; 104° C for 6 h # 90%, and 427%; 110° C for 3 h # 94%, and 425%. NIR calibrations for water (moisture) based on the Karl Fischer method were ($r^2 = 0.98$; SEC = 0.20). In conclusion, a need to evaluate and improve moisture methods, and standardize practices in laboratories is apparent.

Key Words: Moisture, Oven Drying, Karl Fischer

ARPAS-FASS Symposium
ARPAS-FASS Symposium on Animal Care Training and Certification for Research Facilities and Commercial On-Farm Assessment Programs

672 ARPAS Animal Care Certification Program. J.C. Swanson*[1], [1]*Kansas State University*.

Research and teaching institutions are required to meet training mandates for animal care workers and professionals. The *Guide for the Care and Use of Agricultural Animals In Agricultural Research and Teaching* states "It is the responsibility of the institution to ensure that scientists, agricultural animal care staff, students, and other individuals who care for or use agricultural animals are qualified to do so through training or experience." Although the American Association for Laboratory Animal Science offers certification at the level of techinician and technologist for laboratory animal personnel, no program exists specific to agricultural animal care. The American Registry of Professional Animal Scientists (ARPAS) is developing a certification program specific to agricultural animal care at the professional and technician level. This program is being developed in conjunction with the Federation of Animal Science Societies' development of training modules for the different agricultural species.

Key Words: Animal care, Training, Certification

673 The ARPAS - FASS - AAA Animal Care Project. K.E. Olson*[1], B.R. Baumgardt[2], C.L. Sapp[3], and B.P. Glenn[3], [1]*KEO COnsulting,* [2]*American Registry of Professional Animal Scientist,* [3]*Federation of Animal Science Societies*.

Animal care is an issue of increasing importance to consumers and to retailers. Most species have developed quality assurance programs or best management practices that include animal care guidelines, but in most cases consumers are unaware of these efforts and their use is not documented. The Animal Agriculture Alliance (AAA) is a relatively new organization whose mission is to #support and promote animal agriculture practices that provide for farm animal well-being through sound science and public education.# It is recognized that for a program to be credible with the public it must be based on sound science and be verifiable.

AAA has identified six basic animal care principles felt to be critical in assuring animal well-being. They have contracted with the ARPAS and FASS to develop criteria and a process for evaluation of species specific farm-animal well-being guidelines to assess their compliance with these principles. Submitted programs that comply will be recognized. To the extent possible, quantifiable measures are used to assess compliance.
A two step process has been used in this project. Initially a steering committee, comprised of individuals with scientific backgrounds related to the species being evaluated, as well as others with expertise in animal behavior, veterinary medicine, engineering, transportation and handling, ethics, and consumer interests, developed an umbrella set of criteria for use with all species. Next, species specific subcommittees, comprised of individuals with expertise in each of the species, identified science based numeric ranges and other measures appropriate for assessing care within their species. The species reports are reviewed by the steering committee to provide the greatest consistency possible. Initial species included beef, broilers, dairy, layers, pork, sheep and turkeys. Species programs will be submitted for review and recognition of compliance.
This process assures consumers that all species are being evaluated in a similar manner, buyers that there will be consistency in assessments by different individuals, and producers that the evaluations are based on the best science available.

Key Words: Animal Care, Consumers, well-being